ticularly the kidneys and the liver, where one would expect signs of irritation from the heavy metals.

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PHILIP H. PIERSON, M. D. (490 Post Street, San Francisco)—I was particularly interested in the two cases of coccidioides granuloma, reported by Doctor Jacobson, from the point of view of their pulmonary complications. It is true that the general picture presented by these cases simulates diffuse tuberculosis, but can be differentiated by careful laboratory analyses. I wish to emphasize this point because with incomplete examination patients have received improper and misdirected treatment.

Pulmonary lesions of coccidioides granuloma may simulate a diffuse miliary tuberculosis or a pneumonic consolidation, and healing doubtless takes place by the absorption of the exudate and a resulting fibrosis. The use of copper salts in the treatment of tuberculosis has been tried but largely abandoned because of the irritation of the kidneys. It is interesting to note that in these cases no such toxicity was present.

It is hoped that if cases of coccidioides granuloma are more numerous—and I feel that they must be—careful laboratory examinations, especially sputum analyses, will so segregate them that specific treatment may be applied.

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DOCTOR JACOBSON (closing)—In closing this discussion I wish to express my gratitude to the discussants for the generous fashion in which they have participated in the consideration of this paper. I am especially thankful to Doctor Davidson for the important point which he has brought out in his discussion, emphasizing the necessity of microscopic smears in the diagnosis of this condition. Only within the past six weeks have I been asked to outline treatment for a patient suffering from coccidioides who has been operated upon by two very prominent surgeons for tuberculosis of the bones of the forearm. The true nature of the disease was only revealed after the operation, through microscopic smears and cultures.

I am certainly appreciative of Doctor Sutton's testimonial, and wish to state that the patient referred to by him is still under my care and doing very well.

Doctor Frost is certainly at liberty to disagree with me on the ubiquitous nature of the disease, if he so chooses, but I wish to assure him that my statement in this connection is backed up by many recorded cases in the literature from different parts of the country, and from the different states already enumerated.

The dosage, intervals, and technique employed are one ampoule of colloidal copper into the gluteal region administered at intervals of four to seven days, depending upon reactions. So far we have been very fortunate in not noticing any unfavorable reactions, either local or visceral, from the use of colloidal copper.

I thoroughly agree with Doctor Pierson that careful laboratory examinations in many cases of so-called suspected tuberculosis will reveal the presence of coccidioidal granuloma in regions heretofore unsuspected.

In conclusion I wish to state that since writing this paper two additional cases of this infection have come to my service at the Los Angeles General Hospital. Both of these patients have systemic involvement and are responding quite favorably to the treatment with colloidal copper. I intend to write a supplementary paper on the progress of these cases and on some experimental work that I am at this time carrying on in connection with this disease.

Baby Should Spend His Vacation Safe at Home—The baby should never be exposed to the perils of vacationing, declares Doctor Thomson, writing in *Hygeia* for June. Home is the safety zone for babies. Even if the food and water supply are pure, the mere change from one supply to another is enough to upset the child badly, and he is not able to withstand exposure to the various diseases with which he may come in contact when away from home.—*Atlantic Medical Journal.*

STREPTOCOCCUS MUCOSUS INFECTION CAUSING LATERAL SINUS THROMBOSIS*

By H. J. PROFANT, M. D.
Santa Barbara

DISCUSSION *by Hill Hastings, M. D., Los Angeles; Harrington B. Graham, M. D., San Francisco; Barton J. Powell, M. D., Stockton.*

THIS case would seem worth reporting because of the atypical course of an otitis media yet typical of the treacherous way the streptococcus mucosus infection acts. A study of the history, findings and progress of this case is very instructive from many standpoints; especially in its emphasis of the importance of observing even what may seem to be a mild infection of the middle ear. Last summer I was impressed by the emphasis stressed upon this type of infection by Doctors Alexander, Neumann and Rutin of Vienna while attending their clinics and I shall incorporate their teachings in the discussion of this case.

CASE REPORT

The report is as follows: A boy, age 7, patient of Doctor Coblentz of Santa Maria, had the following history: About the third of April, 1926, he developed a mild acute rhinitis and two days later complained of pain in the right ear. Doctor Coblentz was called and he found a very slight injection of the drum with no bulging and a temperature of 100°. He prescribed warm phenol and glycerine for the ear and rest in bed, and requested that he be notified if the boy did not improve. The mother stated that the pain subsided and she kept him in bed about four days. During that time the temperature was normal and in three days the mother considered him well enough to go back to school. For ten days he attended to his usual duties with no evidence of discomfort; then he suddenly became acutely ill. Doctor Coblentz was again called and found the boy had a temperature of 104° with all the signs of a beginning meningitis. The boy made no reference to the ear. A thorough general examination was made for possible source of trouble but nothing was found. The next day the meningitic symptoms were less marked, but the temperature remained up. The third day the temperature went down, all signs of meningitis disappeared and a few hours of calm were followed by a severe chill lasting fifteen minutes, then a temperature of practically 105° followed with profuse sweating. Twenty-four hours later the cycle was repeated and then the cycles came at shorter intervals.

I was called in consultation five days after the onset of the chills and fever and found the following: the boy appeared acutely ill, he had just had a severe chill followed by a temperature of 105° and a pulse of 130. There was no nystagmus and the fundi were normal; no signs of meningitis, nose and throat negative; no right mastoid tenderness; the whispered hearing test

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practically normal; Weber to right and right Rinne negative. The ear drum was dull, had no light reflex and appeared thick; no redness in the canal and no sagging of the posterior-superior canal wall. I advised an immediate exploration of the mastoid in spite of the late hour at night. On opening the cortex the superficial cells appeared entirely normal. The first impression was that a mistake in diagnosis had been made. I went down into the antrum through dense bone and was again surprised and disappointed; there was no free pus but merely a small amount of thick grayish-red granulation tissue. I then continued posteriorly and suddenly entered an abscess at the knee of the sinus; the dura and sinus had been exposed by the infection and the abscess was localized at this point. I did not explore the sinus for two reasons: first, because the condition of the patient was not good, and second, because I wished to obtain drainage without disturbing nature's barrier too much. When I incised the ear drum I obtained no pus, but was decidedly impressed with the peculiar thick feeling the incision produced. The next morning the boy was very much better, but twenty-four hours later had a cycle of chills and fever and another ten hours after that. I then decided to wait no longer, and under a light anesthetic I exposed the sinus and found an obturating thrombus. Doctors Thorner and Coblentz rapidly ligated the internal jugular above the facial vein, and I then removed the clot and free bleeding was obtained from above and below. There were no more cycles of chills and fever, but the boy was still very septic, showing the strain of ten days of septic absorption. For this reason ten ccs. of a 1 per cent mercurochrome solution were given intravenously on the first and third days following the second operation. He made a slow but uneventful recovery.

BACTERIOLOGY

In a consideration of the bacteriology one is referred to the work of Schottmuller, who classified three types of streptococcus.

1. Streptococcus longus or hemolyticus
2. Streptococcus mitus or viridans
3. Streptococcus mucosus.

Streptococcus hemolyticus forms long chains, and in blood agar lakes and decolorizes the blood in a halo around each colony. Streptococcus viridans and streptococcus mucosus produce a green discoloration in blood agar but no hemolysis, and the streptococcus mucosus forms glutinous colonies. The streptococci have been much studied of late and a great number of strains have been separated upon the basis of carbohydrate fermentation. When cocci of the morphology of the streptococci are found, it is first necessary to distinguish them from the pneumococcus to which they are closely related. Their colonies on ordinary media are similar; both are gram positive and about the same size. Colonies of pneumococci on blood-serum resemble those of the streptococci; colonies on blood agar show a green zone like those of streptococcus viridans. Pneumococci are soluble in bile, streptococci are not and the pneumococci ferment inulin, streptococci do not. Upon the basis of immunologic relations, four types of pneumococci are found. Recently, after the work of W. L. Holman, the streptococcus mucosus has been classified by many bacteriologists as belonging to type III and called pneumococcus mucosus; however, this is still under question because strains have been found which hemolyzed blood, did not ferment inulin and were not bile soluble, whereas typical pneumococci do not act in that manner.

RUTTIN'S CLASSIFICATION

Ruttin gives a clinical classification of the bacteriology of otitis media and its complications; namely, capsulated and non-capsulated.

I. Capsulated are
   a. Streptococcus mucosus
   b. Diplococci or pneumococci
II. Non-capsulated
   a. Streptococci

He contends that the staphylococcus is never a primary infection in any acute suppurative otitis but is secondary as a contamination. Neumann and Ruttin carried out experiments for one year in which every myringotomy was done through a sterile glass tube and a culture taken. A streptococcus was found each time and the staphylococcus was not present until two or three days later, and then may predominate over the streptococcus. Judging from reports in the literature, Ruttin believes the hemolytic streptococcus is more common in America, whereas in Austria the streptococcus mucosus is more frequently found. He gives as a typical clinical picture the following: patient has a mild or moderate rhinitis and develops a slight pain in the ear associated with a fullness which seems to spread over half of the head. Very often the patient complains only of this fullness, diminished hearing and a buzzing in the ear. The tympanic membrane is reddish-gray and not transparent. The fullness and tinnitus is not relieved by Politzer inflation. In any case in which the hearing is not improved and the fullness and tinnitus are not relieved, the routine procedure is to do a paracentesis near the lower border of the tympanic membrane. When this is being done in a case of streptococcus mucosus infection, one has the feeling as Ruttin describes it of "cutting bacon." This is due to the fact that this condition has a tendency to form this type of connective tissue of mucoid consistency. You will note from the above description that the early stages of a streptococcus mucosus infection must be differentiated from the ordinary secretory catarrh of the middle ear, and if confused may be neglected with serious results. After this initial stage there is a latent period which may be a few weeks or several months, and since this infection has a tendency to grow in bone, intracranial complications are apt to develop. This third stage comes on suddenly. In the case I report the acute stage was mild and short, the latent period seventeen days and the third stage sudden and severe.

The right ear was the one involved. Statistics

have been compiled which show that the right lateral sinus is more frequently involved than the left in the proportion of three to two. (Campbell Laryngoscope, Vol. XXXII, No. 10, Page 775.) You will recall that the right lateral sinus is continuous with the superior longitudinal and is larger than the left, which is continuous with the straight sinus. The lateral sinus extends from the internal occipital protuberance to the posterior angle of the parietal bone; then turns almost vertically at what is known as the knee, into the sigmoid groove, where it is known as the sigmoid sinus. The knee is the portion which is most commonly attacked in an infectious process. The next in frequency is the jugular bulb, which is a downward continuation of the sigmoid. In doing the mastoid operation in this case I traced the infection from the antrum posteriorly to the knee of the sinus. Between the upper surface of this bend of the sinus and the mastoid roof is found in some temporal bones a triangular space. In this space the streptococcus mucosus had destroyed the bone and first formed an epidural abscess which caused the initial meningial irritation. Fortunately, for him, the dura covering the lateral convex surface of the brain is a tough and resistant structure, very loosely adherent to the inner plate of the skull. Unfortunately, in the region of the large venous sinuses the dura divides into two layers, one of which lines the bone and forms the outer wall of the sinus, and the other layer forms its inner wall. Thus a perisinous abscess may readily invade the sinus as occurred in this case. The upper half of the sigmoid plate had been destroyed. Experience teaches that granulations upon the dura are nature's process of walling off the infection; and some operators report good results in merely establishing drainage without attempting to remove the thrombus. I felt justified, therefore, in postponing any further work, especially since the boy's general condition was so feeble.

I feel that this procedure was an important factor in his ultimate recovery. The change in his general condition the morning following the operation was most gratifying. Even the two cycles of chills and fever which followed were less severe and distressing than those preceding. The ligation of the jugular vein was done very rapidly; the question of resection did not enter because the vein was normal. I was interested to hear Ruttin state that he never resects the vein even when found involved; he opens it and leaves it in an open wound of the neck so that he can syringe up through the jugular bulb. Only in extreme changes with marked destruction will he consider a resection.

As to the use of mercurochrome:

Judging from reports in the literature on this subject, the advisability of the use of intravenous injections of mercurochrome is still unsettled. At the Santa Barbara Clinic it has been used with varying results. Dr. Hilmar Koefod, internist, had one of the most dramatic successes with a pneumococcus meningitis following a pneumonia. The patient, a boy of 10, was given an intravenous injection of 1 per cent mercurochrome, and the improvement was as dramatic as a change following a crisis. In Doctor Koefod's opinion, the improvement was definitely due to the mercurochrome; prior to its use the prognosis had been poor. Unfortunately, all severe infections do not respond as well following its use. We have had no unfortunate or fatal reactions and are tempted to use it in severe septic infections. In this particular case I am reporting, the principal object of the intravenous injection of mercurochrome was to attack the numerous foci of infection which had been spread from the infected thrombus during the cycles of chills and fever. The boy's general condition was definitely better following its use, as was evidenced by his less toxic appearance and improvement in the quality of the pulse.

I believe that the most valuable lesson from this case report can be summed up in the following adage: "Be concerned about every ear infection, no matter how mild it may seem." To me an anxious mother is a comfort. I usually say to her, "I know your child's ear will get well because you are worried about it." An anxious mother is observing and does not neglect to call for assistance. An early myringotomy is the means of preventing most of the serious complications. Other important conclusions are:

1. Streptococcus mucosus is a treacherous infection of the ear because of the mild onset; the latent period, which may be long; and the tendency to attack bone.

2. Streptococcus mucosus is classified by some bacteriologists as a pneumococcus mucosus.

3. A two-stage operation proved successful; first, the mastoidectomy which established drainage; second, the ligation of the internal jugular and removal of the infected thrombus.

4. Intravenous injection of 1 per cent mercurochrome aided in combating the sepsis.

1421 State Street.

DISCUSSION

HILL HASTINGS, M. D. (1136 West Sixth Street, Los Angeles)—Doctor Profant's paper impresses us anew with the danger of streptococcus mucosus infection. We all know, to our sorrow, how occasionally we are deceived by a false security in acute ear cases in which the infecting organism is the streptococcus mucosus.

One thought: it is quite remarkable how seldom sinus thrombosis occurs in acute mastoid disease when one considers that the small veins of the infected mastoid drain into the lateral sinus.

Doctor Profant is to be congratulated on doing an exploratory mastoid operation in the face of almost negative mastoid signs, but guided by the history of a recent acute infection which had apparently healed. Furthermore, he is to be commended in the prompt opening of the lateral sinus when septic signs continued.

As to ligation of the jugular I believe that otologists should, when a general surgeon is at hand, ask the general surgeon to do the ligation. The reason for this is that the general surgeon doing neck surgery can do the ligation more quickly than the otologist as a rule, and thereby save additional shock to the patient.

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HARRINGTON B. GRAHAM, M. D. (Shreve Building, San Francisco)—That there is an organism that has a tendency in the adult to form a mucoid secretion in the middle ear and which is very apt to lead on after an insidiously mild course of from two weeks to four

months to intracranial complications, there is no doubt in spite of the discussion as to how the organism may be classified.

Schottmuller described the organism bacteriologically, and Neuman and Ruttin followed it with Gohn clinically and in the autopsy room until they had a well-marked picture of its ravages to which very little has been added. I reviewed this work in the *Annals of Otology* in December, 1910, and in September, 1913, described two cases of perforation of the petrous portion of the temporal bone due to the streptococcus mucosus. In Vienna I saw a case that had been operated for an acute mastoid. The patient had healed and was back at work. About a month after the operation he came to me stating that his head was feeling somewhat peculiar and he thought he would see if there might not be something the matter with the ear. Everything was apparently normal and the man made so little of his symptoms that I judged that he was still oversolicitous. That afternoon he was brought in unconscious and died in a few hours, autopsy showing an old meningitis with a membrane covering the dura a quarter cm. thick. The organism was streptococcus mucosus.

It is interesting that I have not seen a case for years. I believe these become virulent in cycles.

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BARTON J. POWELL, M. D. (United Bank and Trust Building, Stockton)—Fortunately such a case as was so efficiently handled by Doctor Profant does not occur very frequently.

The profession in general and aurists in particular should offer congratulations to Doctor Profant. In the San Joaquin Valley I have seen mastoid after mastoid operated upon with uninterrupted convalescence. It is this occasional infection with obscure symptoms that should be kept in mind that a life may be saved.

As Doctor Profant says, "be concerned about every ear infection no matter how mild it may seem."

COMPARATIVE INCIDENCE OF PELVIC PATHOLOGY*

By HOMER CARLTON SEAVER, M. D.
Los Angeles

DISCUSSION *by Ludwig A. Emge, M. D., San Francisco; Thomas O. Burger, M. D., San Diego; George Joyce Hall, M. D., Sacramento.*

THE relative incidence of the various types of pelvic pathology, the frequency of associated pathology, and other practical points of interest derived from a study of 1000 consecutive abdominal pelvic operations, most of which were done by members of the gynecological staff of the Los Angeles General Hospital during a two-year period, are the points under consideration in this paper.

This list does not include all of the major pelvic cases, nor does it include any of the preoperatively diagnosed carcinomata of the cervix and only a few of the extrauterine pregnancies which enter the hospital. No mention is made in this paper of pathological conditions in the lower genital tract, nor will there be an attempt to enumerate the various microscopical findings.

Textbooks treat each disease of the female pelvis as a definite clinical and pathological entity and definite laws are set down for the management of each separate type of pathology. Practically, this isolated classification is misleading, as operation so frequently reveals more than one type of pathology.

The following cases will be grouped under the major pathological condition present and the pelvic lesions occurring coincidentally with this major pathology, will be termed the associated pathology.

Of these 1000 cases, the major pathology was diagnosed as follows: 409 cases of pelvic inflammatory disease; 317 fibroids; 124 abnormal displacements of the uterus; 94 benign ovarian tumors; 29 malignancies; 18 extrauterine pregnancies; and seven adenomyomata. Two normal pregnancies were wrongly diagnosed as pathological conditions.

APPENDICITIS

Of the 1000 cases, the appendix was surgically absent in 157. In 399, it was considered normal and not removed, or pronounced normal by the pathologist after removal. In 444 out of a possible 843, or 52 per cent, the microscopical diagnosis was subacute, chronic or periappendicitis. This diagnosis was returned in seven cases of extrauterine pregnancy; 17 uncomplicated displacements of the uterus; 98 uncomplicated benign pelvic tumors and in 322, or 78 per cent, of the 409 cases of pelvic inflammatory disease.

Pathologists state that there is no difference, microscopically, between these and primary appendices. If this is true, the following inferences may be drawn from the above figures; either that the occurrence of chronic appendicitis secondary to pelvic disease is of little significance or else there is a definite risk taken in the nonsurgical treatment of any type of intrapelvic pathology.

EXTRAUTERINE PREGNANCIES

In 18 cases, the major pathology was extrauterine pregnancy. The scarcity of this condition is due to the fact that these are assigned to another service. Most of the cases in this group were of long duration and secondarily infected.

UTERINE DISPLACEMENTS

There were 124 cases of uterine displacement which were treated by abdominal operation. The list includes all the various degrees of prolapse in which some sort of suspension could be used for their relief. The apparently large percentage of this condition is explained by the fact, that, in 84 of the cases, there was present, aside from the displacement, other pelvic pathology which called for surgery. The youngest patient was 16, the oldest 70, and the average 29.

BENIGN OVARIAN TUMORS

In 94 cases the major pathology was a benign ovarian tumor. There were all types from the simple follicle cyst to the massive papillary cystadenoma. The youngest patient was 18, the oldest 70, and the average 39. Excision of the tumor, only, was done in 38 cases and an accompanying hysterectomy in 56. There were no deaths in this group.

MALIGNANCIES

That only 29 cases of malignancy are recorded is due to the fact that no preoperatively diagnosed cancers of the cervix are included. The total of

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